



## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<b>(51) International Patent Classification <sup>6</sup> :</b> <b>A23L 1/325</b>	<b>A1</b>	<b>(11) International Publication Number:</b> <b>WO 98/09539</b> <b>(43) International Publication Date:</b> 12 March 1998 (12.03.98)
<b>(21) International Application Number:</b> PCT/FI97/00526 <b>(22) International Filing Date:</b> 5 September 1997 (05.09.97) <b>(30) Priority Data:</b> 963520 6 September 1996 (06.09.96) FI <b>(71) Applicant (for all designated States except US):</b> OY SCAN-FISH AB [FI/FI]; Houtskär, FIN-21770 Mossala (FI). <b>(72) Inventors; and</b> <b>(75) Inventors/Applicants (for US only):</b> BERGMAN, Tor [FI/FI]; Houtskär, FIN-21770 Mossala (FI). VIRTALAINE, Tuomas [FI/FI]; Vesitie 83, FIN-21500 Piikkiö (FI). <b>(74) Agent:</b> PATENTTITOIMISTO KARI PIRHONEN OY; PI 142, FIN-20521 Turku (FI).		<b>(81) Designated States:</b> AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US, UZ, VN, ARIPO patent (GH, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).  <b>Published</b> <i>With international search report.</i> <i>With amended claims.</i> <i>In English translation (filed in Finnish).</i>
<b>(54) Title:</b> METHOD FOR PREPARATION OF SAUCE BASE  <b>(57) Abstract</b>  <p>A method for the preparation of a clear fish sauce base, in such a way that red-meat fish, such as salmon or rainbow trout, or shellfish and vegetables are used in the preparation. According to the preparation method, raw materials are cooked in water, strained, separated to separate the fat, cooled and strained by multi-stage pressure filtration or ultrafiltration equipment to obtain the required smoothness and clarity. The sauce base obtained is concentrated, sterilised and packed aseptically.</p>		

**FOR THE PURPOSES OF INFORMATION ONLY**

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AL	Albania	ES	Spain	LS	Lesotho	SI	Slovenia
AM	Armenia	FI	Finland	LT	Lithuania	SK	Slovakia
AT	Austria	FR	France	LU	Luxembourg	SN	Senegal
AU	Australia	GA	Gabon	LV	Latvia	SZ	Swaziland
AZ	Azerbaijan	GB	United Kingdom	MC	Monaco	TD	Chad
BA	Bosnia and Herzegovina	GE	Georgia	MD	Republic of Moldova	TG	Togo
BB	Barbados	GH	Ghana	MG	Madagascar	TJ	Tajikistan
BE	Belgium	GN	Guinea	MK	The former Yugoslav Republic of Macedonia	TM	Turkmenistan
BF	Burkina Faso	GR	Greece	ML	Mali	TR	Turkey
BG	Bulgaria	HU	Hungary	MN	Mongolia	TT	Trinidad and Tobago
BJ	Benin	IE	Ireland	MR	Mauritania	UA	Ukraine
BR	Brazil	IL	Israel	MW	Malawi	UG	Uganda
BY	Belarus	IS	Iceland	MX	Mexico	US	United States of America
CA	Canada	IT	Italy	NE	Niger	UZ	Uzbekistan
CF	Central African Republic	JP	Japan	NL	Netherlands	VN	Viet Nam
CG	Congo	KE	Kenya	NO	Norway	YU	Yugoslavia
CH	Switzerland	KG	Kyrgyzstan	NZ	New Zealand	ZW	Zimbabwe
CJ	Côte d'Ivoire	KP	Democratic People's Republic of Korea	PL	Poland		
CM	Cameroon	KR	Republic of Korea	PT	Portugal		
CN	China	KZ	Kazakhstan	RO	Romania		
CU	Cuba	LC	Saint Lucia	RU	Russian Federation		
CZ	Czech Republic	LI	Liechtenstein	SD	Sudan		
DE	Germany	LK	Sri Lanka	SE	Sweden		
DK	Denmark	LR	Liberia	SG	Singapore		
EE	Estonia						

## METHOD FOR PREPARATION OF SAUCE BASE

The object of the invention is a method for the preparation of a sauce base from fish as a raw material, according to which the fish raw material is cooked in water, after which fat  
5 and at least part of visible sediments are separated from it.

Traditionally households, restaurants and catering kitchens have made sauces and meat and fish stocks by hand and on the spot as necessary. Preparation of sauces and stocks is, however, time-consuming. Because nowadays restaurants and catering kitchens are  
10 always busy, the preparation of sauces must also be quick and easy. An effort is therefore made to preprepare food as far as possible. To make food preparation easier, it is possible to prepare a large amount of a pre-prepared product for making sauce or stock, i.e. the so-called sauce base, which can be used later as necessary. It is clear that in this case the final preparation of a sauce or stock for different dishes can be accomplished  
15 considerably faster.

The preparation of a sauce base or a stock base from meat or bones is not particularly difficult, as such a pre-prepared product keeps well. This is due, among other things, to the fact that the part of meat stock which spoils most easily, i.e. the fat, can be removed  
20 by fairly simple procedures. The chemical composition of the fat contained in a meat stock also keeps better than fish oil, for example. There are also several known industrial methods for preparing a meat sauce base, which means that restaurants and catering kitchens can purchase the pre-prepared products for sauces and stocks whenever they need them.

25 On the other hand, the prepreparation of fish sauces and stocks is problematic. One reason for this is the fact that fish oil spoils easily. It is generally known that in the preparation of clear fish stock or fish sauce with the proper taste, only white-meat fish species can be used which contain very little or no oil. Such white-meat fish are, for  
30 example, perch, whitefish and pikeperch. A fish stock or fish sauce prepared according to generally accepted, good food preparation practice may not taste of fish oil.

In restaurants and catering kitchens a fish sauce base can only be prepared in amounts that are consumed within a few days, because, due to the stock's rapid spoiling properties  
35 and the changes in taste prior to spoiling, it cannot be stored longer. Therefore it is clear that only certain restaurants specialising in fish dishes are able to prepare laborious clear fish sauces and fish stocks. Small restaurants, diners or catering kitchens do not have the resources or time to spend on preparing fish and/or shellfish sauces according to generally accepted, good food preparation practice. Efforts to develop quick and efficient

methods for industrial preparation of such an easy-to-use additive-free base for fish and/or shellfish sauce from red-meat fish and/or shellfish have not been successful. Restaurants wishing to serve fish and/or shellfish sauces that are free from additives and have been prepared according to generally accepted, good food preparation practice

5 must have a pot boiling continuously, in which the sauce base is prepared. In this case, the strong smell of fish caused by boiling the sauce base easily spreads from the kitchen into the dining room, which is not desirable.

Restaurants serving fish have also faced a problem concerning the fact that fish raw

10 materials are usually bought as semifinished products, such as fillets or ready-made portions. Shellfish raw materials usually also come as frozen semifinished products such as shelled shrimps. In this case, the restaurants do not get fish heads, backbones, fins, shellfish shells and other parts of fish or shellfish left over in food preparation that are needed for a fish and/or shellfish stock. The more semifinished products and frozen foods

15 are used, the greater is the problem concerning raw materials for stock. In this respect, too, the situation is the most difficult in diners and catering kitchens.

Another problem faced by restaurants serving fish is that it is often difficult to obtain white-meat fish. The supply of raw material depends essentially on the time of year and the size

20 of the catch. Professional fish farming usually concerns only red-meat fish species, such as Atlantic salmon and rainbow trout. However, using the known methods, it is not possible to make high-quality sauce base that is free from additives and tastes the same as a sauce made according to generally accepted, good food preparation practice. Fish and/or shellfish stock should be clear, and the sauce base made from it should be

25 translucent and smooth. However, a stock made of red-meat fish is normally cloudy and greasy.

The purpose of this invention is to create a new method for the preparation of a fish and/or shellfish sauce base or a fish stock that does not involve the problems presented

30 above. Compared with products on sale at present, a particular added value for a fish and/or shellfish sauce base prepared according to this invention is the fact that the sauce base is free from additives, easy to use and keeps for a long period even at room temperature.

35 It is characteristic of the method for preparing a fish and/or shellfish sauce base relating to the invention

- that red-meat fish, such as salmon or rainbow trout is boiled in water
- that after boiling, the fat is separated with a separator and at least part of the visible sediments are separated with a separator from the fish raw material,

- and that the separated fish raw material is strained through one or more colanders so that a translucent or clear sauce base is obtained.

It is characteristic of one advantageous embodiment of the method

- 5 - that fish raw material containing red-meat fish, such as salmon or rainbow trout or parts of these, and, together with the fish or alternatively instead of them, shellfish or parts of these, are boiled in water,
- that besides fish and/or shellfish raw material, also vegetables may be used as raw material, depending on the recipe in use at any given time,
- 10 - that fat and most of the visible sediments are separated from the cooking liquid obtained from fish and/or shellfish raw material by separating the stock with a centrifugal separator,
- that fat and most of the visible sediments are, if necessary, separated from the cooking liquid made from any vegetable raw material by separating the stock with a
- 15 centrifugal separator,
- and that the separated fish and/or shellfish raw material is strained through one or more pressure filters or ultra filter systems so that a translucent or clear fish and/or shellfish stock is obtained,
- that the separated and strained fish and/or shellfish stock and the vegetable stock
- 20 prepared according to any given recipe are combined and the sauce base thus obtained is concentrated to a dry matter content of approximately 7%,
- and that the concentrated sauce base undergoes UHT treatment and is finally cooled and packed aseptically to ensure that the product keeps well and is easy to use.

25 By the method relating to the invention, a clear fish and/or shellfish sauce base is obtained from different parts of fish or shellfish and vegetables. In particular, the method enables a base for a fish and/or shellfish sauce to be prepared in such a way that, regardless of the raw material, the product is almost fat-free, has the right taste, even better than that of previous products, and is visibly clearer. A product prepared according

30 to the method contains no flavour enhancers, preservatives or any other additives and keeps well even at room temperature. According to the method, red-meat fish, such as salmon or rainbow trout, and shellfish, such as shrimps, can be used as raw material without making the product greasy or cloudy or giving it an inappropriate taste.

35 A product prepared according to the method relating to the invention is excellently suited for restaurants and catering kitchens, because it is easy to use and, being aseptically packed, keeps well. It also has low fat and salt content, and is free from additives, and therefore is also suitable, under current recommendations, for use in hospitals, for children and persons with allergies, particularly as sensitivity of different degrees to the

Na-glutamate generally used in stock products and also to other flavour enhancers have increased in recent years.

5 According to another advantageous embodiment, the sauce base is clarified by boiling after de-greasing, in which case nearly all insoluble particles are precipitated and, if so required, the sauce base is completely clear. For example seaweed extract, egg white or various commercial precipitating agents can be used to help precipitation. Before separation, it is often advantageous to strain the stock to separate the largest particles.

10 IMPLEMENTATION OF THE METHOD OF THE INVENTION:

Fish and/or shellfish are placed in boiling water and boiled in 90-100°C water, most advantageously for about 45 minutes to 1 hour. Alternatively, it is also possible to place fish and/or the shellfish in cold water, in which case the total duration of the treatment is about 1-2 hours, depending on the size of the pot and the heating capacity available.

20 After boiling the fish stock, the raw materials of which may be fish and/or shellfish, is strained and taken to a centrifugal separator, where fat and most of the sediments insoluble in water are separated from it. After separation, the fish stock is cooled by a heat exchanger and strained by a multi-stage pressure filter or an ultra filter system to obtain the required smoothness and clearness.

25 After separation, a separate clarifying stage can be carried out, in which the stock is boiled either alone or together with a clarifying agent. These agents are, for example, seaweed or egg white. At this stage, boiling can be continued without changing the flavour of the stock, as there is only very little fat left in the fish stock which could spoil chemically during boiling. Before de-greasing, there is always a risk of oxidation of fat caused by boiling.

30 A vegetable stock is prepared separately by boiling whole or chopped hard vegetables, requiring a long cooking time, for 2 to 3 hours, in 80-90°C water. As different vegetables require different cooking times to obtain the best possible taste, vegetables that give their flavour quickly and seasonings are added towards the end of the cooking process, the vegetable stock is strained and, if necessary, separated by means of a centrifugal separator in order to separate the sediments, after which the vegetable stock is cooled with a heat exchanger. The vegetable stock is strained by a multi-stage pressure filter to obtain the required smoothness and clearness.

The fish and/or shellfish stock prepared in this way and the vegetable stock are combined,

after which the sauce base thus obtained is concentrated to a dry matter content of approximately 7%. The sauce base is sterilised by UHT treatment and is aseptically packed.

5 The fish raw material used is fresh or frozen whole fish, fresh fresh or frozen fish heads and backbones, fresh fish skins, fins, tails or other similar parts of fish from a fish cleaning plant. The fish raw material can also be totally or partly composed of shellfish, which are fresh or frozen, whole shellfish or parts of these, such as shells.

10 Fresh fish and/or shellfish raw materials are not treated in any way before cooking, but frozen chunks of raw material are, most advantageously, sawn into pieces of 10 x 10 x 20 cm.

The vegetable raw material used can be fresh or dried vegetables, root vegetables and seasonings. Vegetable raw materials which cook quickly, such as small carrots or onions, 15 do not have to be cut. On the other hand, it is advantageous to chop large and hard raw materials, such as large onions and carrots as well as celeriac, swedes or parsnips before cooking. It is advantageous to steep dried vegetables or root vegetables in cold water before boiling to ensure that the aromas are released.

20

It is essential that the fish and/or shellfish raw material is not cooked for too long. The cooking time is optimal when the raw material has become soft enough so that the bones of the fish heads and backbones can be separated. A longer cooking time only lengthens the duration of the process and creates a bitter taste and cloudiness in the ready stock.

25 Frozen raw material and shellfish shells require a longer cooking time to release the flavours and aromas. A heating and cooking time of 1-1½ hours is suitable for these ingredients.

After cooking, the fish and/or shellfish stock is strained, after which its dry matter content 30 is, for example, approximately 2%. After this the stock is taken to a centrifugal separator, which removes fat and the largest insoluble particles from the stock. At its most advantageous, a separated stock contains no fat at all.

It is advantageous to cook hard vegetables that withstand long cooking times, such as 35 celeriac, swede or parsnip, in 80-90°C water for several hours, even for 8 hours. With a view to the progress of the process, however, a cooking time of 2-3 hours is the most advantageous. It is also advantageous to cook delicate vegetables, such as carrots and parsley, for a considerably shorter time, for example, for 15-30 minutes, so that the flavour they give remains fresh, and so that the dark colour released by parsley, for example,

does not cloud the stock. It is therefore most advantageous to add the raw materials of the vegetable stock to the pot at different times.

It is also advantageous to cook dry seasonings together with vegetables. Thus their  
5 cooking time is as long as possible, in which case the flavour and aromas are most easily released, or the cooking time can be optimised according to what is most suitable as regards the strength of the flavour. If necessary, fat and sediments are also removed from the vegetable stock with a centrifugal separator. The need depends on the amount of visible particles and vegetable fat. The need for separation depends on the recipe and on  
10 the quality of the raw materials at any given time.

The separated fat-free fish stock and the vegetable stock are cooled with heat exchangers and pumped into intermediate containers. As necessary according to the required process, the fish stock, shellfish stock and vegetable stock can still be kept  
15 separate or they can be mixed in an intermediate container. The cooling can be continued further in an intermediate container or intermediate containers, as necessary. The stage of mixing the fish stock and vegetable stock can be chosen according to the production stage and container capacity at any given time.

20 After this, the cooled and possibly further cooled and/or mixed stock or stock mixture is strained in a multi-stage pressure filter. This filtration is advantageously four-stage and most advantageously even five- or six-stage. Pressure filtration can also be replaced by an ultrafiltration system, which gives a corresponding result. In an ultrafiltration process the stock is circulated through the equipment and the retent is removed, which, in this  
25 case, is the fraction causing cloudiness. The purpose of straining is to obtain a smooth and translucent appearance for the stock product. At its most advantageous, the colour of the product is yellowish green and the product is clear and it looks smooth and has no visible cloudiness. The size of particles causing cloudiness is usually within the range of 1-20 micrometres. To remove particles from a stock, it is advantageous to use pressure  
30 filters with mesh sizes covering this range in suitable steps, or an ultrafiltration membrane for which a suitable mesh size is chosen.

For example polycarbonate, steel or polypropylene can be used as the material for the filters at the beginning of the series of pressure filters. At the end of the series, the  
35 material of the filters may, for example, be polypropylene, polycarbonate, polysulphone or glass fibre. For example cellulose acetate, polypropylene or polycarbonate can be used as the material for ultrafiltration membranes.

After this, the fat-free and strained stock or stock mix is taken to a storage tank, where the



stock components, which are possibly still separate, are mixed. The stock mix thus obtained is concentrated to a solids content, which is, for example, approximately 6 to 10%. As regards the use, taste and aroma of a fish and/or shellfish sauce base, an advantageous solids content is 7%, for example. The characteristics in use of a sauce  
5 base prepared according to the method presented above are extremely advantageous for the preparation of both fish and shellfish dishes and fish and shellfish sauces.

No denseners, thickening agents, acidity regulators, preservatives or stabilisers have been added to a fish and/or shellfish sauce base prepared according to the method  
10 relating to the invention. This is one of the most advantageous characteristics of the sauce base prepared according to the method relating to the invention, because, prepared this way, it can be used in hospitals, for example, and it can be used to prepare sauces and other similar foods for children and persons suffering from allergies, for example. Apart from this, purity and freedom from additives are significant advantages as  
15 regards the general wholesomeness and desirability of the product.

The concentration of a fish stock to a dry matter content of approximately 7% can be carried out, for example, by boiling the stock in a vacuum pan. However, the concentration is carried out in the most advantageous way by reverse osmosis or by means of a tube-  
20 type evaporator, in which case the treatment is as rapid as possible, and, being gentle, does not alter the delicate taste of fish or shellfish. A concentrated fish sauce base prepared as described above is ready to use as such. However, in order to be able to transport and sell it economically to industry, catering kitchens and households, it must be rendered into a form that keeps better.

25 UHT treatment can be carried out, for example, at a temperature of 140-145°C for 3-5 seconds by direct steam injection, which makes the above-mentioned fish stock a sterilised product. When a sauce base thus sterilised is cooled and packed aseptically immediately after the UHT treatment, a product is obtained which keeps at room  
30 temperature for as long as several months.

The use of a fish and/or shellfish sauce base prepared according to the invention is extremely simple and uncomplicated. It is extremely difficult and time-consuming to prepare a clear fish or shellfish sauce that is free from additives and tastes right by any  
35 other method, both in catering kitchens and in households.

It is easy to make different sauces from the sauce base prepared according to the invention by varying the ingredients added to the sauce base. By adding white wine, a good white wine sauce is obtained, and by adding butter and cream, a cream sauce is

obtained. Naturally the sauce base can also be used as such as an ingredient of clear and thickened stocks and soups.

#### EXAMPLE 1:

5

Backbones, fins and fish skins, which are obtained as by-products from the industrial fish processing process, were placed in a cooking pot with a steam jacket, and containing boiling water. The raw material was cooked at approximately 100°C for 45 minutes. The froth generated by the cooking process was removed from time to time from the surface of the pot.

10

When the fish raw material had been cooked, i.e. when the backbones had become soft and the meat could easily be separated from them, the cooking liquid was poured through a colander into a steel basin, from where it was pumped through a heat exchanger to a centrifugal separator. By means of the heat exchanger the temperature of the stock was regulated to make it optimal for the fat-separating process, i.e. to about 80-90°C. From the separator the fish stock was passed through a transfer pipe to a heat exchanger, by means of which the stock was cooled quickly to about +5°C and after that pumped into a cooled storage tank.

20

Hard vegetables that require a long cooking time, such as celeriac and swedes, were cut into approximately 5cm x 5cm pieces and poured into a pot with a steam jacket, and containing boiling water. Whole onions and some of the dried seasonings, such as black peppers, were also put into the pot. The vegetables were cooked for about an hour at 80-90°C, after which whole carrots and onions were added to the pot. After half an hour, vegetables that cook quickly, such as leek and parsley, were added to the soup. After a short final boiling the vegetable stock was poured through a colander into a steel basin, from where it was pumped through a fairly coarse pressure filter into a heat exchanger, where the stock was cooled to about +5°C. From the heat exchanger the stock was further pumped into a cooled storage tank.

25

30

The fish stock and vegetable stock in their respective storage tanks were pumped after intermediate storage, as specified in the recipe, one part of vegetable stock and five parts of fish stock, into a cooled tank with a powerful agitator, where the stocks were mixed. From this tank the mixed fish-vegetable stock was pumped through a five-stage series of pressure filters into a cooled storage tank.

35

The ready-made fish-vegetable stock, with a dry matter content of approximately 2.5%, was transferred to a thermal film concentrator, where the dry matter content of the stock

was increased to 7%. After this, the concentrated stock underwent UHT treatment for 4 seconds by direct steam injection, at a temperature of 145°C. After the UHT treatment the product was cooled down in an aseptic heat exchanger to approximately 20°C and packed aseptically in 1-litre tetrapacks.

5

**EXAMPLE 2:**

Backbones, fins and fish skins, which are obtained as by-products from the industrial fish processing process, were frozen as 60x30x10 cm blocks of raw material and stored at -  
10 21°C. Shells, which are produced as residue from the shrimp processing process, were frozen in 60x30x30 cm blocks of raw material and stored at -21°C. Frozen fish and shrimp blocks were taken for handling, as required by the recipe used, in the ratio of 1:3. The frozen blocks were sawn into approximately 10x10 cm pieces and placed in a pot with a steam jacket, and containing boiling water. Steam was introduced into the jacket of the  
15 pot to heat the soup, and the raw material was stirred evenly until all the fish and shrimp blocks had melted. The fish-shellfish raw material was cooked at about 100°C for 60 minutes. The froth produced during the cooking process was removed from the surface of the pot from time to time.

20 When the raw material was cooked, i.e. when the backbones and shrimp shells had become soft and the meat was easily separated from the backbones, the cooking liquid was poured through a colander into a steel basin, from where it was pumped through a heat exchanger into a centrifugal separator. By means of the heat exchanger the temperature of the stock was regulated to make it optimal for the fat-separating process,  
25 i.e. to about 80-90°C. From the separator the hot fish stock was pumped through a five-stage pressure filtration system. After this the clear fish-shellfish stock was pumped into a heat exchanger, where the temperature of the stock was lowered to about +5°C. Finally the stock was pumped into a cooled storage tank.

30 The vegetable stock was cooked as described in Example 1. After this the clear vegetable stock was pumped into a heat exchanger, where the temperature of the stock was lowered to about +5°C. Finally the stock was pumped into a cooled storage tank.

The fish-shellfish stock and the vegetable stock were separated as described in Example  
35 1. The finished fish-shellfish stock was concentrated, UHT-treated and packed as the sauce base in Example 1.

**EXAMPLE 3:**

Frozen fish and shellfish raw material as described in Example 2 was used as raw material in the cooking process. In addition, fresh raw materials as described in Example 1 and, in addition, frozen bivalves were used in the soup. The cooking process was corresponding to that in Example 2. The time at which the cooking process was stopped  
5 was determined as in Examples 1 and 2. Separation of fat from the stock was carried out as in Examples 1 and 2. After this the stock was cooled by means of a heat exchanger to +5°C and pumped into a storage tank.

As regards root vegetables that withstand long cooking times, the vegetable raw material  
10 was dried. Dried vegetables and root vegetables were steeped overnight in cold water and were then poured into a pot with a steam jacket, and containing boiling water. Otherwise the cooking process and the raw materials, such as onion and carrot, were the same as in Examples 1 and 2. Finally the vegetable stock was cooled by means of a heat exchanger to approximately +5°C and pumped into a cooled storage tank.

15 The cooled fish-shellfish stock was strained to clarify it by means of ultrafiltration equipment. The storage tank was used as the feed tank for ultrafiltration and the sediments obtained as the retent were removed from the cycle. Finally the fish-shellfish stock clarified by ultrafiltration and the vegetable stock clarified by separation were  
20 combined by pumping them in the ratio of 1:5 into a cooled storage tank used as the final storage. The ready-made fish-shellfish-vegetable stock was concentrated, UHT-treated and packed as in Examples 1 and 2.

In the following, the alternatives for the preparation processes relating to the invention are  
25 described, using examples, with reference to the accompanying drawings, in which

Figure 1 shows one advantageous embodiment of the preparation method relating to the invention.

30 Figure 2 corresponds to Figure 1 and shows another embodiment of the preparation method.

Figure 3 corresponds to Figure 1 and shows a third embodiment of the preparation method.

Figure 4 corresponds to Figure 1 and shows a fourth embodiment of the preparation method.

35 In the schematic diagram in Figure 1 the fish and/or the shellfish are first cooked, after which the fish and/or shellfish are strained and transferred to a centrifugal separator, where fat and most of the sediments insoluble in water are separated from the cooking liquid. After separation the fish stock is cooled by means of a heat exchanger and strained

by multi-stage pressure filtration or ultrafiltration equipment in order to obtain the required smoothness and clarity.

Vegetable stock is prepared separately by cooking whole or chopped vegetables in water.  
5 After that, seasonings are added, the vegetable stock is strained and, if necessary, separated in a centrifugal separator to separate sediments and/or vegetable fat, after which the vegetable stock is cooled by means of a heat exchanger. If necessary, the vegetable stock is strained by multi-stage pressure filtration in order to obtain the required smoothness and clarity. Fish and/or shellfish stock prepared in this way and the vegetable  
10 stock are combined, after which the sauce base thus obtained is concentrated to the required dry matter content. The sauce base is sterilised by UHT treatment and packed aseptically.

Figure 2 shows a preparation process corresponding to that in Figure 1, but after  
15 separation there is a separate clarifying stage, where the stock is cooked either as such or with a clarifying agent.

Figure 3 shows a preparation process in which the clarifying stage and straining are before cooling. The straining result and the risk of microbial contamination during straining  
20 can be controlled by adjusting the temperature of the stock to be strained. Correspondingly, Figure 4 shows the method corresponding to Figure 3 without clarification.

In Figures 1-4 an arrow has been drawn with a broken line from the point "cooking of  
25 vegetable stock" to the point "separation of fish stock". This means that the vegetable stock can as an alternative be mixed with the fish stock already at this stage. Both the fish stock and the vegetable stock can be mixed together already at an early stage of the process or at any time during the process. In other words, separation, straining and other intermediate stages, for example, can be carried out on the fish stock and the vegetable  
30 stock, either separately or together. The procedure depends on the requirements of the preparation method and the recipe of the desired sauce base. However, all these alternatives have not been shown in the drawings.

It is obvious to a person skilled in the art that the different embodiments of the invention  
35 may vary within the scope of the claims presented below.

## CLAIMS

1. A method for the preparation of a fish sauce base from fish raw material, according to which fish raw material is cooked in water, after which fat and at least part of the visible  
5 sediments are separated from it, c h a r a c t e r i s e d in
  - that red-meat fish, such as salmon or rainbow trout, are cooked in water
  - that after cooking, fat and at least part of the visible sediments are separated from the fish raw material by means of a separator,
  - and that the separated fish raw material is strained through one or more filters so that  
10 a translucent or clear sauce base is obtained.
2. A method as claimed in claim 1, c h a r a c t e r i s e d in
  - that besides red-meat fish, such as salmon or rainbow trout, parts of these fish, or shellfish are cooked in water,
  - 15 - that after cooking, fat and most of the visible sediments are separated from the fish raw material by means of a separator,
  - that the separated fish raw material is strained through one or more filters to obtain a translucent or clear fish stock,
  - that besides fish raw material, also vegetables are cooked separately in water,
  - 20 - and that the cooked vegetable-seasoning stock is combined with the fish stock so that a translucent or clear fish sauce base is obtained.
3. A method as claimed in claim 1 or 2, c h a r a c t e r i s e d in that the fish raw material is cooked in water most advantageously for 45 min - 1 h and the vegetables are  
25 cooked separately, depending on the type, most advantageously for 15 min - 3 h.
4. A method as claimed in claim 1, 2 or 3, c h a r a c t e r i s e d in that most advantageously fresh fish and/or shellfish are added to the fish raw material soup into the water.  
30
5. A method as claimed in claim 1, 2 or 3, c h a r a c t e r i s e d in that frozen fish and/or shellfish are added to the fish raw material soup.
6. A method as claimed in any of the claims 1 to 5, c h a r a c t e r i s e d in that after  
35 cooking, the fish raw material is strained and transferred to a centrifugal separator, where fat and most of the sediments insoluble in water are separated from it.
7. A method as claimed in any of the claims 1 to 6, c h a r a c t e r i s e d in that after separation the fish stock is strained by pressure filtration or by means of ultrafiltration

equipment having one or more stages in order to obtain the required smoothness and clarity.

8. A method as claimed in any of the claims 1 to 7, characterised in that the fish  
5 and/or shellfish stock is cooled quickly immediately after cooking, before filtration or immediately after cooking and filtration.

9. A method as claimed in any of the claims 1 to 7, characterised in that the fish  
10 and/or shellfish are either placed in boiling water and cooked in 90-100°C water, most advantageously for about 45 min to 1 h, or they are placed in cold water, in which case the cooking time is prolonged by as much time as the heating takes.

10. A method as claimed in any of the claims 1 to 9, characterised in that the  
15 vegetable stock is prepared separately so that hard vegetables that withstand long cooking times, such as celeriac, are cooked whole or chopped for 2-3 h, and vegetables that require a shorter cooking time, such as carrot, whole or chopped for about 1 h, and vegetables that easily change their flavour, such as parsley, are cooked for about 15 minutes in water, the temperature of which is 80-90°C.

20 11. A method as claimed in any of the claims 1 to 10, characterised in that seasonings are added to the vegetable stock, the vegetable stock is strained and, if needed, separated in a centrifugal separator to separate the sediments, and that the vegetable stock is strained, if needed, by pressure filtration with one or more steps, using  
25 cartridge filters or ultrafiltration to obtain the required smoothness and clarity.

12. A method as claimed in any of the claims 1 to 11, characterised in that the vegetable stock is cooled by means of a heat exchanger immediately after cooking or filtration.

30 13. A method as claimed in any of the claims 1 to 12, characterised in that the fish and/or shellfish stock and vegetable stock which have been prepared are combined, after which the sauce base thus obtained is concentrated thermally or most advantageously by reverse osmosis to a dry matter content of 6-10%, most advantageously approximately 7%.

35 14. A method as claimed in any of the claims 1 to 13, characterised in that fat is separated from the cooked fish raw material by separation so that the percentage of fat is below 0.1%.

15. A method as claimed in any of the claims 1 to 14, characterised in that the concentrated fish and/or shellfish sauce base undergoes UHT treatment, for example, by direct steam injection and is cooled aseptically.
- 5 16. A method as claimed in any of the claims 1 to 15, characterised in that the concentrated fish and/or shellfish sauce base that has undergone UHT treatment and has been cooled aseptically is packed aseptically, in which case the product most advantageously keeps at room temperature for as long as a year.



## AMENDED CLAIMS

[received by the International Bureau on 4 February 1998 (04.02.98);  
original claim 1 amended; remaining claims unchanged (3 pages)]

1. A method for the preparation of a sauce base from fish raw material or from  
corresponding raw material, according to said method
- 5   - fish raw material or corresponding raw material is cooked in water,  
- dry matter is strained from the stock,  
- possibly some vegetable stock which has been prepared by cooking vegetables is  
added to the fish stock or to the corresponding stock,  
- fat is separated from the prepared fish stock or from the corresponding stock,
- 10   c h a r a c t e r i s e d   i n  
- that for preparation of the sauce base it is used fat containing fish raw material, most  
advantageously red-meat fish, such as salmon or rainbow trout or parts of these, and  
together with the fish raw material or alternatively instead of them, corresponding raw  
material, such as shellfish or parts of these,
- 15   - that the raw material, such as fish and/or shellfish are placed in water and cooked,  
most advantageously for about 45 minutes to 1 hour,  
- that after cooking the prepared stock, such as fish stock or corresponding stock, is  
strained to separate backbones and other parts from the stock,  
- that fat is separated from the stock, most advantageously by means of a separator,
- 20   so that the percentage of fat is below 0.1%,  
- and that the separated stock is strained through one or more filters so that a  
translucent or clear sauce base is obtained.
2. A method as claimed in claim 1, c h a r a c t e r i s e d   i n
- 25   - that besides red-meat fish, such as salmon or rainbow trout, parts of these fish, or  
shellfish are cooked in water,  
- that after cooking, fat and most of the visible sediments are separated from the fish  
raw material by means of a separator,  
- that the separated fish raw material is strained through one or more filters to obtain a
- 30   translucent or clear fish stock,  
- that besides fish raw material, also vegetables are cooked separately in water,  
- and that the cooked vegetable-seasoning stock is combined with the fish stock so that  
a translucent or clear fish sauce base is obtained.
- 35   3. A method as claimed in claim 1 or 2, c h a r a c t e r i s e d   i n that the fish raw  
material is cooked in water most advantageously for 45 min - 1 h and the vegetables are  
cooked separately, depending on the type, most advantageously for 15 min - 3 h.
4. A method as claimed in claim 1, 2 or 3, c h a r a c t e r i s e d   i n that most

advantageously fresh fish and/or shellfish are added to the fish raw material soup into the water.

- 5 5. A method as claimed in claim 1, 2 or 3, characterised in that frozen fish and/or shellfish are added to the fish raw material soup.
6. A method as claimed in any of the claims 1 to 5, characterised in that after cooking, the fish raw material is strained and transferred to a centrifugal separator, where fat and most of the sediments insoluble in water are separated from it.
- 10 7. A method as claimed in any of the claims 1 to 6, characterised in that after separation the fish stock is strained by pressure filtration or by means of ultrafiltration equipment having one or more stages in order to obtain the required smoothness and clarity.
- 15 8. A method as claimed in any of the claims 1 to 7, characterised in that the fish and/or shellfish stock is cooled quickly immediately after cooking, before filtration or immediately after cooking and filtration.
- 20 9. A method as claimed in any of the claims 1 to 7, characterised in that the fish and/or shellfish are either placed in boiling water and cooked in 90-100°C water, most advantageously for about 45 min to 1 h, or they are placed in cold water, in which case the cooking time is prolonged by as much time as the heating takes.
- 25 10. A method as claimed in any of the claims 1 to 9, characterised in that the vegetable stock is prepared separately so that hard vegetables that withstand long cooking times, such as celeriac, are cooked whole or chopped for 2-3 h, and vegetables that require a shorter cooking time, such as carrot, whole or chopped for about 1 h, and vegetables that easily change their flavour, such as parsley, are cooked for about 15
- 30 minutes in water, the temperature of which is 80-90°C.
11. A method as claimed in any of the claims 1 to 10, characterised in that seasonings are added to the vegetable stock, the vegetable stock is strained and, if needed, separated in a centrifugal separator to separate the sediments, and that the
- 35 vegetable stock is strained, if needed, by pressure filtration with one or more steps, using cartridge filters or ultrafiltration to obtain the required smoothness and clarity.
12. A method as claimed in any of the claims 1 to 11, characterised in that the vegetable stock is cooled by means of a heat exchanger immediately after cooking or

filtration.

13. A method as claimed in any of the claims 1 to 12, characterised in that the fish and/or shellfish stock and vegetable stock which have been prepared are combined, after which the sauce base thus obtained is concentrated thermally or most advantageously by reverse osmosis to a dry matter content of 6-10%, most advantageously approximately 7%.
14. A method as claimed in any of the claims 1 to 13, characterised in that fat is separated from the cooked fish raw material by separation so that the percentage of fat is below 0.1%.
15. A method as claimed in any of the claims 1 to 14, characterised in that the concentrated fish and/or shellfish sauce base undergoes UHT treatment, for example, by direct steam injection and is cooled aseptically.
16. A method as claimed in any of the claims 1 to 15, characterised in that the concentrated fish and/or shellfish sauce base that has undergone UHT treatment and has been cooled aseptically is packed aseptically, in which case the product most advantageously keeps at room temperature for as long as a year.

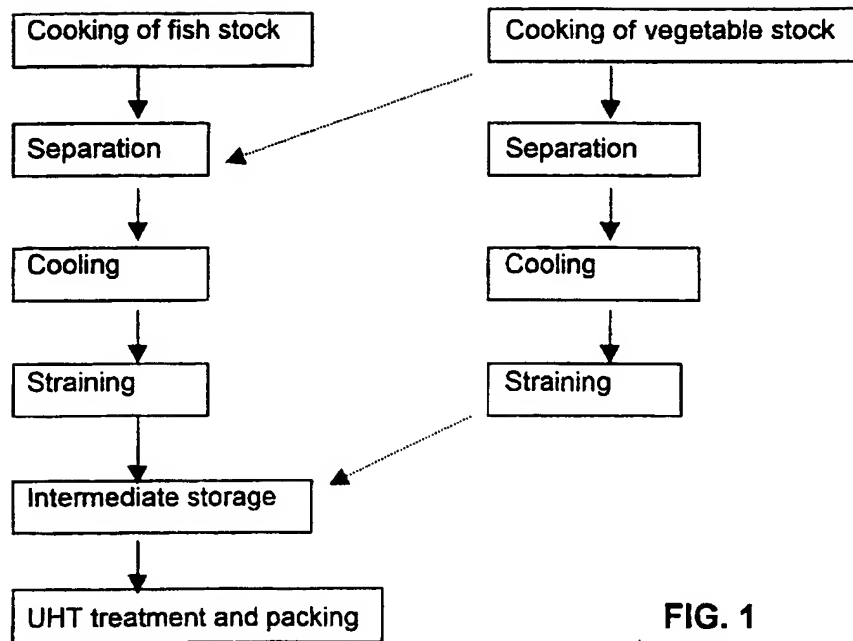


FIG. 1

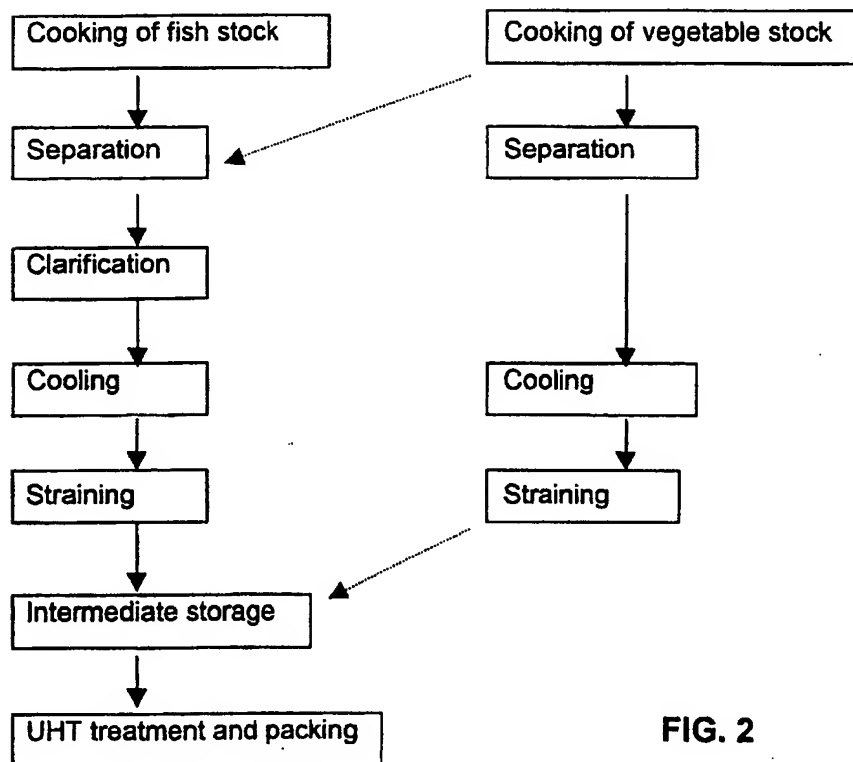


FIG. 2

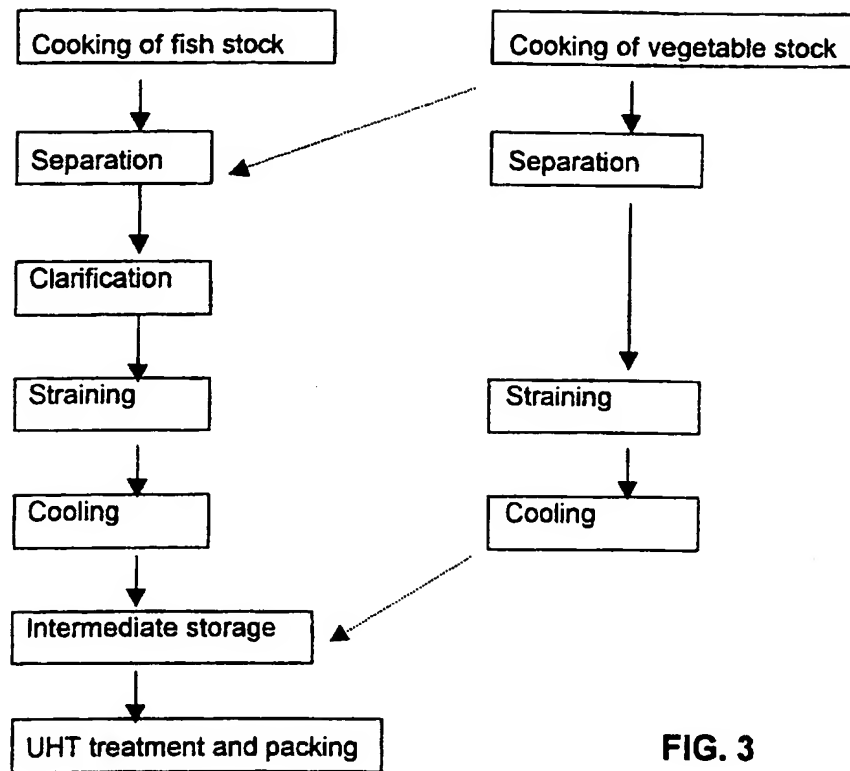


FIG. 3

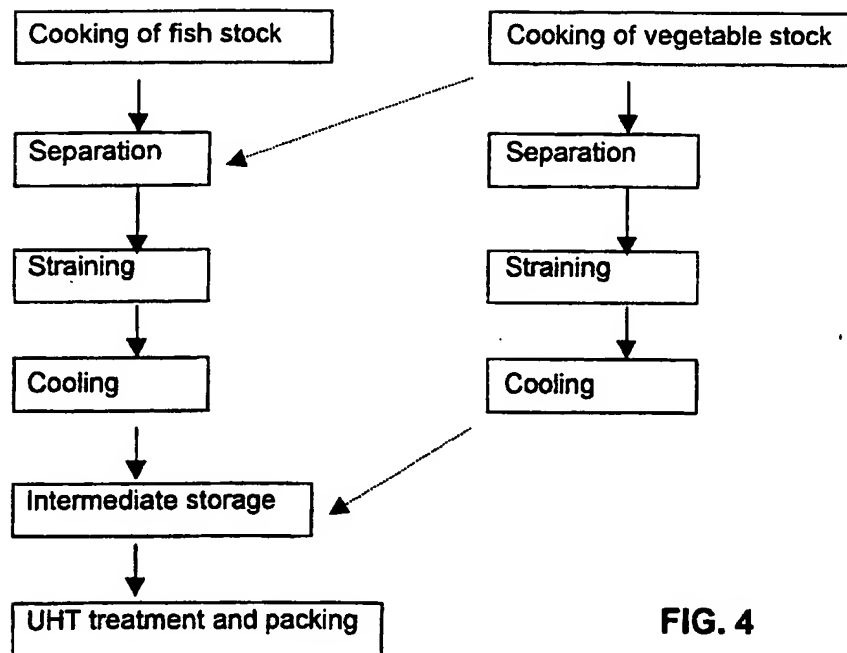


FIG. 4

## INTERNATIONAL SEARCH REPORT

International application No.

PCT/FI 97/00526

## A. CLASSIFICATION OF SUBJECT MATTER

IPC6: A23L 1/325

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: A23L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPI, CLAIMS

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	NO 107491 C (SEIJI ARAKAWA ET AL), 15 November 1965 (15.11.65), The claim	1
Y	--	2-16
Y	DE 4233762 A1 (OSUUSTEURASTAMO, KARJAPORTTI), 15 April 1993 (15.04.93), claims	2-16
A	FR 2730134 A1 (AJINOMOTO CO INC), 9 August 1996 (09.08.96)	1-16
	-----	

☐ Further documents are listed in the continuation of Box C.☒ See patent family annex.

## \* Special categories of cited documents:

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier document but published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance: the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance: the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

Date of mailing of the international search report

10 December 1997

12-12- 1997

Name and mailing address of the ISA/  
Swedish Patent Office  
Box 5055, S-102 42 STOCKHOLM  
Facsimile No. +46 8 666 02 86

Authorized officer

Dagmar Järvman  
Telephone No. +46 8 782 25 00

# INTERNATIONAL SEARCH REPORT

Information on patent family members

04/11/97

International application No.

PCT/FI 97/00526

Patent document cited in search report			Publication date	Patent family member(s)	Publication date
NO	107491	C	15/11/65	NONE	
DE	4233762	A1	15/04/93	FI 91353 B,C SE 505289 C SE 9202978 A	15/03/94 28/07/97 12/04/93
FR	2730134	A1	09/08/96	CN 1135306 A JP 8205810 A	13/11/96 13/08/96

**THIS PAGE BLANK (USPTO)**